How to Read a NASA Cloud Observation and Satellite Match

Learn how to compare your ground observation to data from corresponding satellites with the sample Satellite Match report below.

The left column in white lists all the observations reported and compared with satellite data.

The green column (right) displays your observations that are compared to satellite data (middle columns) including **latitude/longitude**, **date & time**, and observed total **cloud cover**.

You report **cloud opacity**, **cover**, and **type** for each height (high, mid, low). Satellites report **cloud altitude**, **phase**, **opacity**, and **cover.**

Cloud Altitude is measured in kilometers (km). Cloud phase, (liquid, ice or both mixed) is measured in Kelvin (K).

NASA Cloud Observation and Satellite Match

Satellite		GEO	Terra	Your Observation
Universal Date/Time 2018-09-27		16:03	15:58	15:58
Latitude Range Longitude Range		39.89 to 40.53 -75.6 to -74.96	39.8 to 40.6 -75.7 to -74.9	**Latitude 40.21** **Longitude -75.28**
Total Cloud Cover		Scattered 46.45%	Scattered 27.44%	**Scattered (25-50%)**
HIGH	Cloud Cover Cloud Altitude Cloud Phase Cloud Opacity	Few (1.57%) 6.54 (km) Ice 264.38 (K) Transparent	Isolated 12.49% 8.23 (km) Mixed 248.45 (K) Transparent	Contrails: Spreading 5 Few (<10%) Transparent
MID	Cloud Cover Cloud Altitude Cloud Phase Cloud Opacity	Scattered 37.01% 3.97 (km) Mixed 274.64 (K) Transparent	Isolated 14.95% 4.22 (km) Mixed 270.14 (K) Transparent	Altostratus Few (<10%) Transparent
LOW	Cloud Cover Cloud Altitude Cloud Phase Cloud Opacity	Few (7.87%) 1.3 (km) Water 289.3 (K) Transparent	No Clouds	Stratocumulus Scattered (25-50%) Translucent
Corresponding NASA Satellite Images. Click to view image -->		***GOES-16*** Visible Infrared GEO Tutorial	***MODIS*** Rapid Response Worldview MODIS Guide	Sky Visibility : Clear Sky Color : Blue
Are there any comments you would like to add? Be sure to add the name of the satellite for our record.				**Surface Conditions** Snow/Ice No Standing Water No Muddy No Dry Ground No Leaves on Trees Yes Raining or Snowing No

The circles represent cloud cover.

- No Clouds 0%
- Clear >0-10%
- Isolated 10-25%
- Scattered 25-50%
- Broken 50-90%
- Overcast 90-100%
- Obscured 100%

Click to view the satellite images taken at the time of your observation. Learn about GOE/GOES-16 and MODIS images. Click to learn how to use Worldview.

Questions or comments? Submit them here and remember to include the name of the satellite(s) in question.

Your observations also include information about **Surface Conditions** when you made the observation.

NASA Cloud Observation Satellite Match:

Frequently Asked Questions

Q: Why did I receive a Satellite Match?

A: Participants receive a Satellite Match comparison email when their observations falls within +/- 15 minutes of an overpassing satellite. Check the Satellite Overpass Schedule online or visit the Satellite Flyovers tab in the GLOBE Observer app to check upcoming flyovers in your area.

Q: How long after I submit my observation can I expect a Satellite Match?

A: Satellite data is typically received within 1-7 days. Once satellite data is received, it is typically processed within 1-7 days. You will receive a Satellite Match email once your Match is complete.

Q: Why does my observation differ from data retrieved from the satellite?

A: There are a number of reasons your measurements may differ but not every discrepancy implies an error on the part of the user. Satellite imaging uses a form of passive remote sensing to capture the top-down perspective of clouds in the atmosphere, whereas you, the ground observer, observes clouds from the ground-upwards. These two orientations offer complementary perspectives on the formation of clouds in the atmosphere.

For example, if the satellite reports high-level cirrus clouds and the user only reports dense low and mid-level clouds, it may be the case that dense mid-level clouds obscured the observer's view so that high level clouds were not visible from the ground.

Q: Why do satellites not report the same information categories as a ground observer?

A: Satellites record numerous types of measurements, many of which cannot be measured directly by the ground observer (i.e., Cloud Phase, Cloud Altitude). These measurements provide specific information about clouds and atmospheric conditions.

Visit the **GLOBE Atmosphere Protocol eTraining** to learn more about making cloud observations.